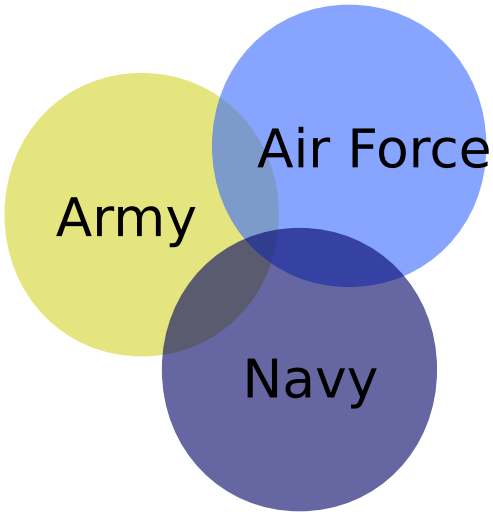
Tri-Service IWEDA Project Update

ASNE MSEA 2004 Technical Review



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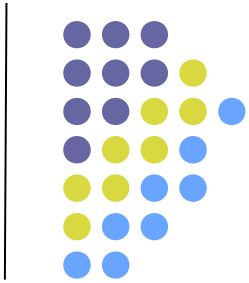
Outline

- Objectives/Charter
- Requirements
- Architecture
- Management Process
- Service Roles and Responsibilities
- Deliverables
- Summary

Project Initiation Objectives



- Meet Joint Force requirements identified by Tri-Service working group in a common Software Requirements Specification (SRS)
- Establish a common architecture
- Provide a pluggable/modularized framework
- Maximize reuse of IWEDA Core logic
- Adopt NITES II (OOR) look-and-feel
- Establish a Rules Management Process with a Centralized Rules Database (CRDB)

Tri-Svc IWEDA Project Charter

A Tri-Service IWEDA Project Charter has been developed to provide a consolidated summary level overview of the project. It provides stakeholders in the project documentation of the agreed upon scope and objectives, approach and deliverables of the project.

Project Working Group :

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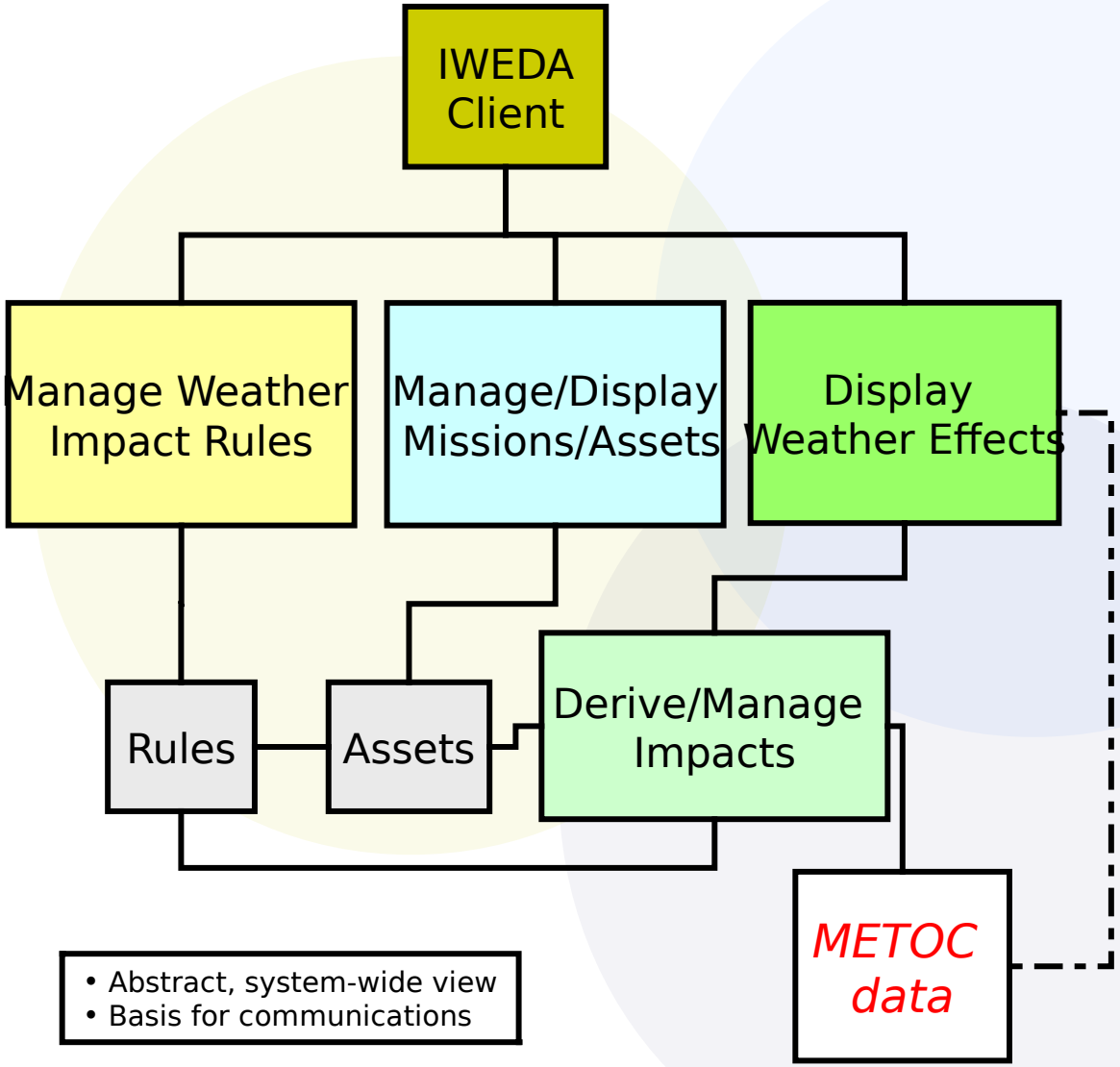
Tri-Svc IWEDA Requirements

Requirements Matrix Document includes detailed requirements:

- Manage Environmental Impact Rules
- Process, Manage and Display Missions/Assets
- Derive Weather Impacts
- Display Weather Effects
- Other Derived Requirements

Common Tri-Service IWEDA Architecture



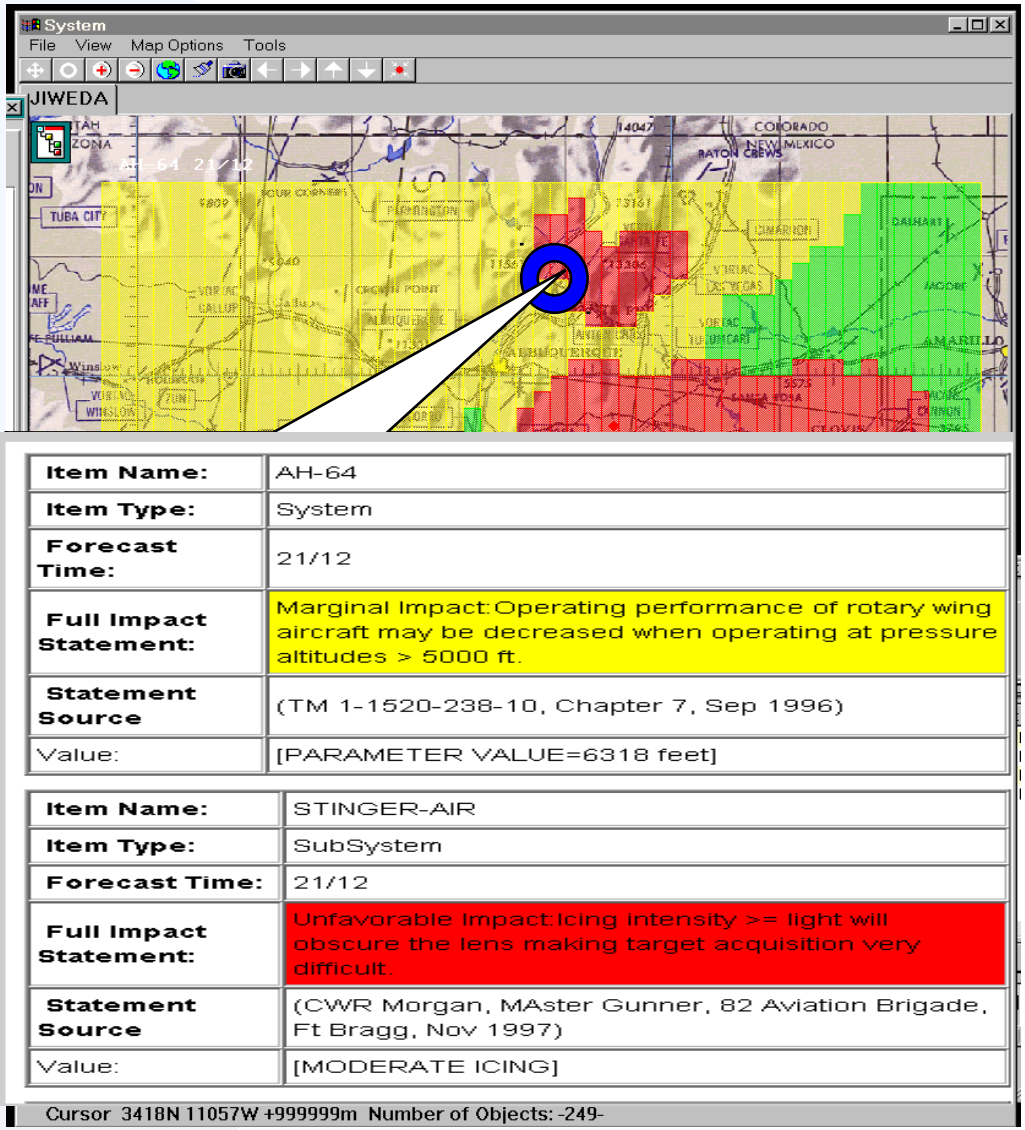
- **Supports pluggable/modularized framework**
- **Adjusts to service-specific systems through jointly defined interfaces**
- **Supports a net-centric paradigm**
- **Adheres to Joint METOC data standards**

Conceptual User Interface Model

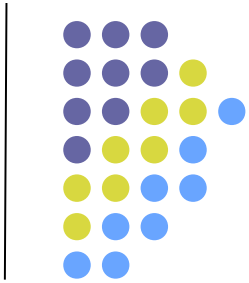
- User/system will have the option to set AOI and forecast periods via common interface
- User can select from provided list of assets
- User can customize/ create assets, sub-assets, and their threshold rules

Conceptual User Interface Model

- User can request plotting of impacts overlaid on Common Operating Picture (COP)
- User can request detailed weather effects for an asset on a selected geo-location
- User can animate weather impact overlays on COP



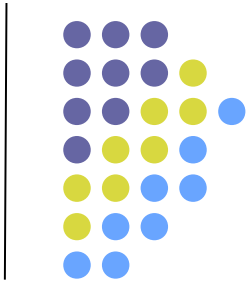
Rules Management Process
Centralized Rules Database (CRDB)



Focus: Establish jointly defined Rules Management (RM) Process to enhance usability of Tri-Svc IWEDA

- **RM Process defines guidelines for**
  - Collecting rules to meet common rules **schema**
  - Validation, Verification and Certification (VV&C)
  - De-confliction of rules submitted by different services
  - Tools for submission/distribution of rules and database management
- **CRDB is the authoritative repository of validated environmental impact rules from all services**
- **ARL serves as CRDB custodian and provides secure access**

Roles & Responsibilities - Army



The Army Research Lab and IMETS will serve as Tri-Service IWEDA Project Leads.

ARL/IMETS Responsibilities:

- Management of Tri-Service IWEDA development effort
  - Lead project development phases – Architecture, detailed design
  - Administer implementation of approved and funded SRS segments
- Hosting and management of CRDB repository, execute de-confliction of submitted rules, and other database maintenance tasks
- Execution of Configuration Management and chairing of Software Configuration Control Board as a voting member
- Collection, verification, validation, and certification (VV&C) of Army rules for integration into CRDB

Roles and Responsibilities - Navy

NUWC will serve as an active design and development partner for the Tri-Service IWEDA Project.

NUWC Responsibilities:

- Provide human factors engineering guidance, prototype GUIs, and NITES II look and feel recommendations
- SCCB support as a voting member
- Facilitation of delivery for VV&C'd Navy rules for integration into CRDB
- Interface assistance to Navy's environmental forecast data sources (i.e. TEDS/TEDServices)
- Advocacy of Tri-Service IWEDA effort in other joint programs like Joint METOC/GCCS
- Advice on architecture/design/development to allow integration of Tri-Service IWEDA into NITES II

Roles and Responsibilities – Air Force

Air Force agencies (AFWA, 88 WS) will serve as active design and development partner for the Tri-Service IWEDA Project.

Responsibilities:

- Provide interface assistance to AF environmental forecast data sources
- Facilitation of delivery for VV&C of AF rules for integration into CRDB
  - Aircraft Weapon System Threshold Collection/VV: 88th Weather Squadron (88WS)
  - Weapon Threshold Collection/VV: 46th Weather Squadron (46 WS)
  - Operational Employment Rules of Engagement Thresholds Collection/VV: ACC (for Combat Air Forces), AMC (for Mobility Air Forces)
  - Repository/Archival and Operational Support: AF Weather Agency (AFWA)
  - Threshold Certification: HQ USAF Deputy Chief of Staff for Operations (USAF/XO)
- SCCB support as a voting member
- Interface assistance to Joint METOC Brokering Language
- Advocacy of Tri-Service IWEDA effort in other joint programs like Joint METOC/GCCS
- Advice on architecture/design/development to allow for future integration of Tri-Service IWEDA into Joint Environmental Toolkit (JET)

Working Group Recommendations

- Formal adoption of Tri-Service IWEDA Project Charter
- Service-level validation of SRS and the associated requirements matrix
- Endorsement of Tri-Service IWEDA Architecture
- Evaluation of NITES II (OOR) Thresholding GUI for potential future integration into IWEDA Architecture
- Commitment of resources for SRS and CRDB implementation
- Continuing Tri-Service IWEDA Collaboration and Development
  - Engineering Working Group
- Software Configuration Control Board (SCCB) Charter
- JMBL support for IWEDA Rules and Impacts

Deliverables

- Software Requirements Phase completed
- Software design and development started Aug 04
- Spiral 1 deliveries on track for Dec. 04-Jan 05

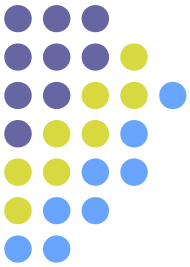
- CRDB activation dependencies
  - SIPERNET Room ready, Certification pending
  - Hardware for server purchased
  - Complete validating/porting of current IWEDA rules

Summary

- Weather impact evaluations will be performed with a common Tri-Service approach
- Joint requirements will drive project development
- Re-use of Army IWEDA and NITES Look-and-Feel will be the mainstay
- Rules Management Process, VV&C (verification, validation, and certification), are to be jointly defined and CRDB established with ARL oversight
- CM (Configuration Management) and SCCB (Software Configuration Control Board) will be executed by IMETS/ARL
- IMETS and AFWA have contributed program level resources supporting Tri-Service IWEDA Project implementation and establishment of CRDB

Back-up

Development Schedule for Spiral-1 Release

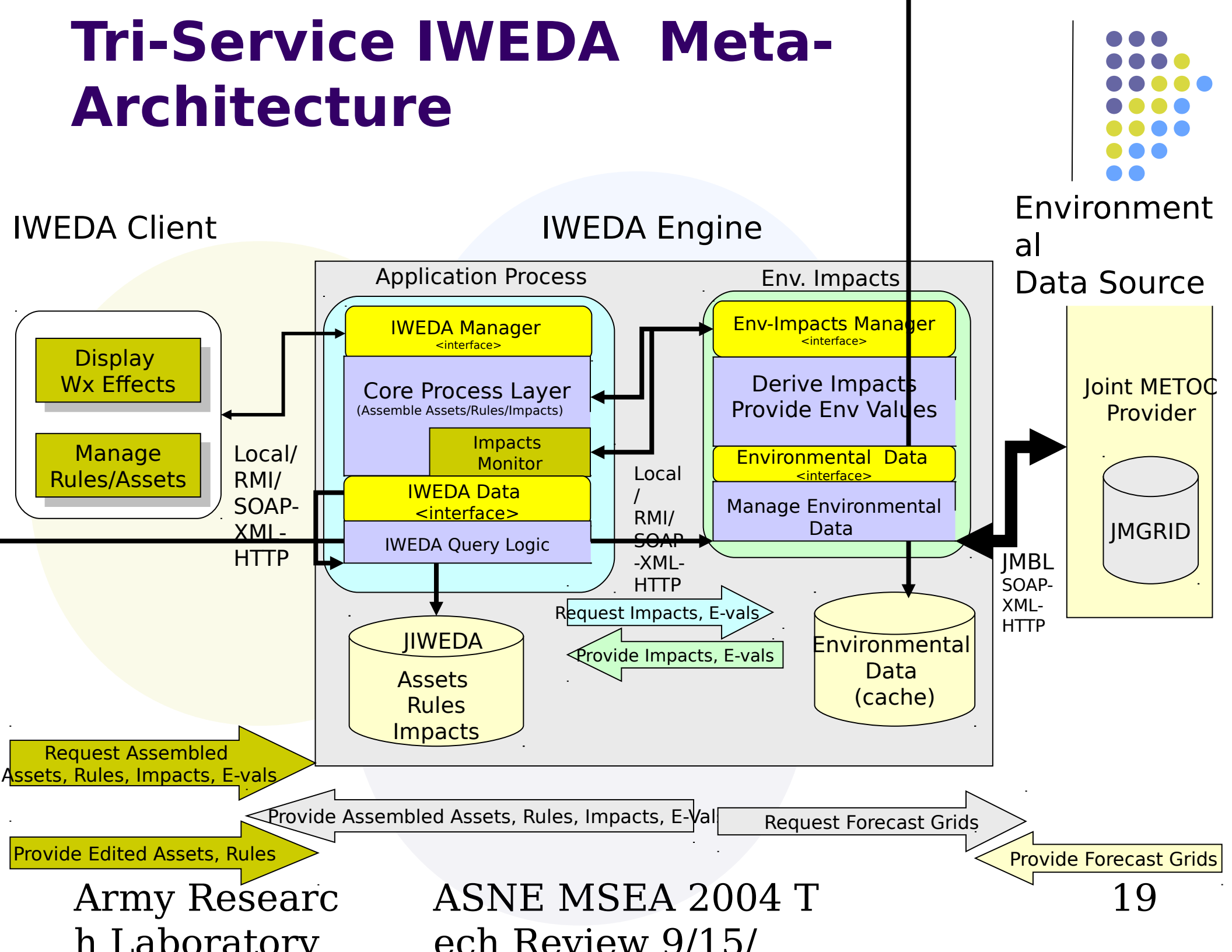


- CRDB (JME) Implementation - Aug 04
- JME API - Sep 04
- REA - Sep 04
- CRDB Web-Service - Oct 04
- IWEDA Engine with Web-Service – Dec 04
- Environmental Impacts Process – Dec 04
- Testing & API Documentation– Dec 04
- Spiral 1 release – late Jan 05

Deliverables

- CRDB implementation of JME
- JME API for accessing JME/CRDB database
- JME Web-service to be used by IWEDA-Engine and REA
- Rules Encoding Application (REA)
- IWEDA Engine API with Web-service to be used by IWEDA and other clients

Tri-Service IWEDA Meta-Architecture

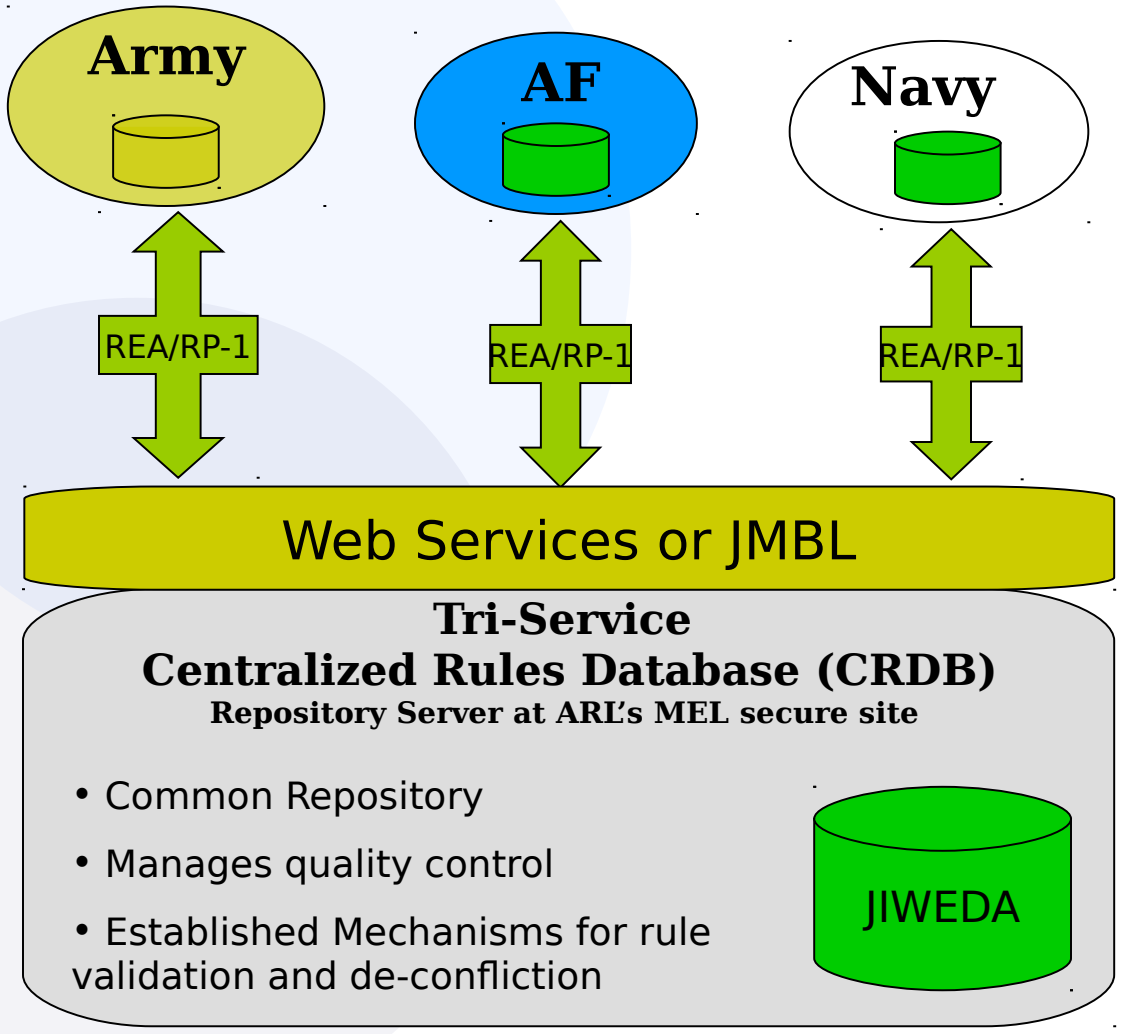


CRDB Status

- **Identified Service-Level Responsibilities**
  - Each service will validate, verify, and certify (VV&C) rules prior to submitting to CRDB
- **Defined Process for Creating/Documenting IWEDA Rules**
  - Tri-Service IWEDA rule schema
  - Rules Encoding Application (REA) Prototype to manage access to CRDB and impose QC validation
  - Enable RP-1 web interface to CRDB, RP-1 supports service level rule management
- **Master Environmental Library Server as CRDB distribution point**
  - FOUO, Secret
  - Service level access for command distribution
- **CRDB will employ JIWEDA schema** – Joint METOC compliant DB -submitted to JMIB review Dec. 2003.

CRDB Concept

Operational Centers mirror CRDB to satisfy service specific deployment requirements.
I.E. IWEDA, JTS, RP-1



REA - Rules Encoding Application

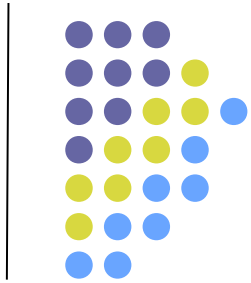
- Provides current validated rule set
- Provides controlled rule editing/creating capabilities
- Submits rules deltas to CRDB
- Provides enhanced search and sorting capabilities to users

Tri-Svc IWEDA Weather Impact Rule Schema

From the Tri-Service IWEDA Working Group meeting on Sep. 20, 2003 at AFWA HQ, it was established that the Standard Definition for Weather Impact Rule must contain of the following elements:

1. Impact Association Index
2. Asset Short Name *(ie UH-60 A/L)*
3. Asset Long Name *(ie UH-60 A/L BLACKHAWK Utility Helicopter)*
4. Asset Type (integer code or a String descriptor ie system, subsystem, component, operation)
5. Asset Association to sub-assets
6. Asset Branch of Service *(Army, AF, Navy, Foreign)*
7. 1st Level of Asset Hierarchy *(Army: BOS, AF: AFCC, Navy: Mission, Foreign: Equipment/Mission Area)*
8. 2nd Level of Asset Hierarchy *(Army: BFA, AF: ASPF, Navy: Platform, Foreign: Systems/Sub-Mission Area)*
9. JMCDM Parameter Name *(Air temperature, wind speed, etc)*
10. JMCDM Parameter Domain (Air, Sea, Space, or Land)
11. Mathematical Operator (<, =, >, <=, >=, or ≠)
12. Threshold Value (double precision value)
13. Default Units for threshold value
14. Impact Category (Favorable, Marginal, Unfavorable)
15. Full Impact Statement
16. Reference Source for Rule Origin
17. Validation Authority for Rule Origin
18. Security Classification *(FOUO, CONF, SECRET, TS. Compliant with JMIB codes if defined)*
19. Rule Status (string description- ie validation, edition)

Funding Requirements Estimates



SRS Implementation:

- GUI updates – (6 mm)
- IWEDA Engine – (6 mm)
  - *Core Application Process Interface – business/query logic*
  - JIWEDA database (Joint METOC compliant)
  - Define client interface
  - Interface with *Environmental Impacts Process*
- *Environmental-Impacts Process* – (4 mm)
  - Derive-Impacts logic - environmental forecast data analysis
  - Interface with METOC/JMGRID data source
  - Define interface to deliver derived impacts

Rules Management Process and CRDB – (6 mm)

- Implement CRDB design to Joint METOC standards (JIWEDA)
- Rules Assimilation - de-confliction, validation, encoding
- Develop web-services site to CRDB

System Testing (test/fix/test) – (1 mm)

User Documentation - (1 mm)

Issues

- Refinement of common Tri-Service IWEDA GUIs
- Agreement on Rule's VV&C process and assign rules collection agencies for each service
- SCCB Agreement
- Enable RP-1 to use JIWEDA schema or CRDB Web-Service
- Requests from C2 community for increased integration of weather impact assessment (i.e. tactical decision aids)
- Request formal Service sponsorship for Tri-Service IWEDA Project